

What is claimed is:

*Sub
a'* →

1. A method for protecting digital samples of content from illicit use by scrambling the content, wherein each sample includes a plurality of bits, ranging from least significant bits (LSBs) to most significant bits, comprising the step of:

scrambling a number of LSBs in each sample according to a scrambling key, while preserving a number of MSBs in each sample, to provide corresponding scrambled samples; wherein:

a number of LSBs is scrambled in each sample such that the scrambled samples are degraded but still recognizable.

2. The method of claim 1, comprising the further step of:

determining a dynamic range of each sample; and adaptively selecting the number of LSBs to be scrambled in each sample according to the dynamic range thereof.

3. The method of claim 1, wherein the samples are provided in successive frames, comprising the further step of:

adaptively selecting the number of LSBs to be scrambled in each sample according to the frame thereof.

4. The method of claim 1, wherein:

P00000000000000000000000000000000

|

said scrambling key is a pseudo-random
scrambling key.

5. The method of claim 1, wherein:
in said scrambling step, the number of LSBs are
scrambled within the same sample using intra-sample
scrambling.

6. The method of claim 1, wherein:
in said scrambling step, the number of LSBs are
scrambled between different samples using inter-
sample scrambling.

7. The method of claim 1, wherein:
in said scrambling step, the number of LSBs are
scrambled between different samples, and within the
same sample, using inter-sample and intra-sample
scrambling, respectively.

8. The method of claim 1, wherein:
in said scrambling step, the number of LSBs are
scrambled between different samples using horizontal
inter-sample scrambling by interchanging bits having
the same weight.

9. The method of claim 1, comprising the
further step of:

embedding the scrambling key, at least in part,
into the scrambled samples for use at a decoder in
descrambling the scrambled samples.

00000000000000000000000000000000

10. The method of claim 9, wherein:
the scrambling key for a current frame of
scrambled samples is embedded, at least in part,
into a previous frame of samples.
11. The method of claim 9, wherein:
the scrambling key for a current frame of
scrambled samples is embedded, at least in part,
into a current frame of samples.
12. A method for descrambling previously
scrambled digital samples of content, wherein each
sample includes a plurality of bits, ranging from
least significant bits (LSBs) to most significant
bits, comprising the step of:
descrambling a number of LSBs in each sample
according to a scrambling key, while preserving a
number of MSBs in each sample, to provide
corresponding descrambled samples; wherein:
a number of LSBs is scrambled in each sample
such that the scrambled samples are degraded but
still recognizable.
13. The method of claim 12, comprising the
further step of:
determining a dynamic range of each sample; and
adaptively selecting the number of LSBs to be
descrambled in each sample according to the dynamic
range thereof.

00000000000000000000000000000000

14. The method of claim 12, wherein the samples are provided in successive frames, comprising the further step of:

adaptively selecting the number of LSBs to be descrambled in each sample according to the frame thereof.

15. The method of claim 12, wherein:
said scrambling key is a pseudo-random scrambling key.

16. The method of claim 12, wherein:
in said descrambling step, the number of LSBs are descrambled within the same sample using intra-sample descrambling.

17. The method of claim 12, wherein:
in said descrambling step, the number of LSBs are descrambled between different samples using inter-sample descrambling.

18. The method of claim 12, wherein:
in said descrambling step, the number of LSBs are descrambled between different samples, and within the same sample, using inter-sample and intra-sample descrambling, respectively.

19. The method of claim 12, wherein:
in said descrambling step, the number of LSBs are descrambled between different samples using

DOCUMENT NUMBER: 10000000000000000000

horizontal inter-sample descrambling by
interchanging bits having the same weight

20. The method of claim 12, wherein the scrambling key is embedded into the scrambled samples, comprising the further step of:

recovering the scrambling key from the
scrambled samples for use in said descrambling step.

21. The method of claim 20, wherein:
the scrambling key for a current frame of
scrambled samples is embedded into a previous frame
of samples.

22. The method of claim 12, comprising the further steps of:

scrambling the scrambling key after descrambling the scrambled sample in said descrambling step.

23. An apparatus for protecting digital samples of content from illicit use by scrambling the content, wherein each sample includes a plurality of bits, ranging from least significant bits (LSBs) to most significant bits, comprising:

a scrambler for scrambling a number of LSBs in each sample according to a scrambling key, while preserving a number of MSBs in each sample, to provide corresponding scrambled samples; wherein:

a number of LSBs is scrambled in each sample such that the scrambled samples are degraded but still recognizable.

24. An apparatus for descrambling previously scrambled digital samples of content, wherein each sample includes a plurality of bits, ranging from least significant bits (LSBs) to most significant bits, comprising:

a descrambler for descrambling a number of LSBs in each sample according to a scrambling key, while preserving a number of MSBs in each sample, to provide corresponding descrambled samples; wherein:

a number of LSBs is scrambled in each sample such that the scrambled samples are degraded but still recognizable.

卷之三